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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,148	12/05/2001	Kuniteru Sakakibara	018656-238	3880

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ART UNIT	PAPER NUMBER
2671	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/002,148	SAKAKIBARA, KUNITERU
	Examiner	**Art Unit**	
	Linzy McCartney	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/3/04*.
2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.
　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-22* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
　　a)☐ All　b)☐ Some * c)☐ None of:
　　　1.☐ Certified copies of the priority documents have been received.
　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.
　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
　　　　application from the International Bureau (PCT Rule 17.2(a)).
　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　　Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claims 1, 2, 6, 8, 11, 13, 14,18, 19 and 22 are rejected under 35 U.S.C. 102(b) as being

clearly anticipated by U.S. Patent No. 5,550,937 to Bell et al (Bell).

a.   Referring to claim 1, Bell discloses an acquiring portion for acquiring a first

original data set and second original data set, the first original data set and the second

original data set respectively representing first and second original data set respectively

representing first and second original images, each of the first and second original images

being obtained by imaging a same object from differing observation points (Fig. 1;

column 5, lines 43-62); a resolution multiplication unit for converting the first original

data set and the second original data set to a first low resolution data set and a second low

resolution data set respectively (Fig. 2; column 5, lines 63 – column 6, line 2); a three-

dimensional generating portion for generating a three-dimensional data set <u>of the object</u>

using the first original data set and the second original data set and the first low resolution

data set and the second low resolution data set; wherein the three-dimensional data set

comprises a first part and a second part, the first part is generated using the first original

data set and second original data set, and the second part is generated using the first low

resolution data set and the second low resolution data set (Fig, 9; column 8, lines 6-61;

column 4, lines 1-9. Note that the collection of three-dimensional cross-correlation surfaces are iteratively generated starting with the lowest resolution version data set and using increasingly higher resolution versions of the captured data up to and including the original data set).

b.   Referring to claim 2, Bell discloses an extracting portion for extracting a first partial image from the first original image (column 7, lines 36-49); and a seeking portion for seeking corresponding points to points in the first partial image within the second original image; wherein the first part of three-dimensional data set is generated by the sought corresponding points (column 8, lines 46-61).

c.   Referring to claim 6, Bell discloses a device for inputting multiple images having a first resolution from different viewpoints of an object (Fig. 1; column 5, lines 43-62); a converter for performing a resolution conversion of each the input multiple images to generate converted images having a second resolution that is different that the first resolution (Fig. 2; column 5, lines 63 – column 6, line 2); a characteristic area extraction unit for detecting characteristic areas of the object from at least one on the input multiple images (column 7, lines 36-49); and a three-dimensional construction unit for constructing three-dimensional data of the object by using data from input images for the characteristic areas of the object and by using data from the converted images for remaining areas of the object (Fig, 9; column 8, lines 6-61).

d.   Referring to claim 8, Bell discloses wherein the first resolution is higher than the second resolution (Fig. 2; column 5, line 63 – column 6, line 2).

e.   Referring to claim 11, Bell discloses wherein a device for inputting images that include images obtained from different viewpoints of an object and having different resolutions (Figs. 1 and 2; column 5, line 42- column 6, line 2); a characteristic area extraction unit for selecting specific areas from at least one image (column 7, lines 36-49); and a three-dimensional construction unit for reconstructing three-dimensional data of the object by using, from among said multiple images having different resolutions, high-resolution images for the selected areas, and low-resolution images for the non-selected areas, and by seeking correspondence between the images obtained from different viewpoints (column 7, lines 37-49; column 8, lines 46-61; Fig. 9).

f.   Referring to claim 13, Bell discloses acquiring a first original data set and second original data set, the first original data set and the second original data set respectively representing first and second original images, each of the first and second original images being obtained by imaging a same object from differing observation points (Fig. 1; column 5, lines 43-62); converting the first original data set and the second original data set to a first low resolution data set and a second low resolution data set respectively (Fig. 2; column 5, lines 63 – column 6, line 2); generating a three-dimensional data set of the object using the first original data set and the second original data set and the first low resolution data set and the second low resolution data set; wherein the three-dimensional data set comprises a first part and a second part, the first part is generated using the first original data set and second original data set, and the second part is generated using the first low resolution data set and the second low resolution data set (Fig, 9; column 8, lines 6-61).

g.   Referring to claim 14, Bell discloses extracting a first partial image from the first original image (column 7, lines 36-49); and a seeking portion for seeking corresponding points to points in the first partial image within the second original image; wherein the first part of three-dimensional data set is generated by the sought corresponding points (column 8, lines 46-61).

h.   Referring to claim 18, Bell discloses inputting multiple images having a first resolution from different viewpoints of an object (Fig. 1; column 5, lines 43-62); performing a resolution conversion of each the input multiple images to generate converted images having a second resolution that is different that the first resolution (Fig. 2; column 5, lines 63 – column 6, line 2); detecting characteristic areas of the object from at least one on the input multiple images (column 7, lines 36-49); constructing three-dimensional data of the object by using data from input images for the characteristic areas of the object and by using data from the converted images for remaining areas of the object (Fig, 9; column 8, lines 6-61).

i.   Referring to claim 19, Bell discloses wherein the first resolution is higher than the second resolution (Fig. 2; column 5, line 63 – column 6, line 2).

j.   Referring to claim 22, Bell discloses a program for generating three-dimensional data according to the method of claim 13 (column 5, lines 36-42).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 3, 5, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bell as applied to claims 1 and 13 above further in view of Akimoto et al., "Automatic Creation

of 3D Facial Models" (Akimoto).

        a.   Referring to claim 3, Bell discloses a three-dimensional reconstruction portion for

producing three-dimensional position data using the first low resolution data set and the

second low resolution data set (column 8, lines 6-61). Bell does not explicitly disclose a

standard model fitting portion for fitting a standard model to the produced three-

dimensional position data to generate the three-dimensional data set. Akimoto discloses a

standard model fitting portion for fitting a standard model to the produced three-

dimensional position data to generate the three-dimensional data set (Fig. 8; page 19,

column 1, paragraph 2 – page 20, column 1, paragraph 3). At the time the invention was

made, it would have been obvious to one of ordinary to modify the apparatus of Bell by

fitting a standard model to the produced three-dimensional position data to generate the

three-dimensional data set as taught by Akimoto. The suggestion/motivation for doing so

would have been because it would allow the creation of animation directly from the

created model (Akimoto, page 16, column 2, paragraph 2).

        b.   Referring to claim 5, Bell discloses an extracting portion for extracting high

precision areas from the first original data set (column 7, lines 36-49; Fig. 7); wherein the

first part of three-dimensional data set comprises the extracted high precision areas

(column 8, lines 46-61).

c.   Referring to claim 15, Bell discloses producing three-dimensional position data using the first low resolution data set and the second low resolution data set (column 8, lines 6-61). Akimoto discloses fitting a standard model to the produced three-dimensional position data to generate the three-dimensional data set (Fig. 8; page 19, column 1, paragraph 2 – page 20, column 1, paragraph 3).

d.   Referring to claim 17, Bell extracting high precision areas from the first original data set (column 7, lines 36-49; Fig. 7); wherein the first part of three-dimensional data set comprises the extracted high precision areas (column 8, lines 46-61).

5.   Claims 4, 12, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell in view of Akimoto as applied to claim 3 and 15 above further in view of U.S. Patent No. 6,532,011 to Francini et al. (Francini).

a.   Referring to claim 4, Bell discloses a seeking portion for seeking corresponding points to points in the first partial image within the second original image; wherein the first part of three-dimensional data set is generated by the sought corresponding points (column 8, lines 46-61). Bell does not explicitly disclose an extracting portion for projecting high-precision areas of the standard model onto the first image and extracting the projected areas as a first partial image. Francini discloses extracting portion for projecting high-precision areas of the standard model onto the first image and extracting the projected areas as a first partial image (column 7, lines 52-60; column 5, lines 19-26; Fig. 4). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the apparatus of Bell by including an extracting portion for projecting high-precision areas of the standard model onto the first image and

extracting the projected areas as a first partial image as taught by Francini. The

suggestion/motivation for doing so would have been because it would allow the creation

of models that appear realistic in static and animated conditions (Francini, column 1,

lines 41-46).

b.   Referring to claim 12, Bell discloses a device for inputting multiple images

obtained from different viewpoints (Fig. 1; column 5, lines 43-62); a converter for

performing resolution conversion regarding each of the input multiple images and

generating multiple images having different resolutions (Fig. 2; column 5, lines 63 –

column 6, line 2); a searching unit for seeking correspondence between the images

obtained from different viewpoints using low-resolution images and reconstructing low-

resolution three-dimensional data of the object (column 8, lines 46-61); a correspondence

seeking unit for seeking correspondence between the images obtained from different

viewpoints using the high-resolution image regarding the areas projected on the higher

resolution image and reconstructing high-resolution three-dimensional data (column 7,

lines 36-49;column 8, lines 46-61); a replacing device for replacing the low-resolution

three-dimensional data regarding said specific areas with high-resolution three-

dimensional data of the object (column 8, lines 22-34; Fig. 7). Bell does not explicitly

disclose a fitting unit for fitting a standard model to the reconstructed low-resolution

three-dimensional data or a unit for projecting the specific areas specified in said standard

model to an image having a higher resolution that said image based on the result of

fitting. Akimoto discloses a fitting unit for fitting a standard model (Fig. 8; page 19,

column 1, paragraph 2 – page 20, column 1, paragraph 3). Francini discloses a unit for

projecting the specific areas specified in said standard model to an image having a higher

resolution that said image (column 7, lines 52-60; column 5, lines 19-26; Fig. 4).

c.   Referring to claim 16, Bell discloses a seeking portion for seeking corresponding

points to points in the first partial image within the second original image; wherein the

first part of three-dimensional data set is generated by the sought corresponding points

(column 8, lines 46-61). Francini discloses projecting high-precision areas of the standard

model onto the first image and extracting the projected areas as a first partial image

(column 7, lines 52-60; column 5, lines 19-26; Fig. 4).

6.   Claims 7, 9, 10, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bell as applied to claims 6 and 18 above further in view of U.S. Patent No. 5,422,989 to Bell et

al.

a.   Referring to claim 7, Bell does not explicitly disclose a first memory for storing

the input multiple images and a second memory for storing the converted images. Patent

No. 5,422,989 discloses a first memory for storing the input multiple images (Fig. 4); and

a second memory for storing the converted images (Fig. 6; column 9, lines 13-34). At the

time the invention was made, it would have been obvious to one of ordinary skill in the

art to modify the invention of Bell by including first and second memories as taught by

Patent No. 5,422,989. The suggestion/motivation for doing so would have been because it

would create a user interface for simultaneously manipulating terrestrial images obtained

by a plurality of airborne sensors (Patent No. 5,422,989, column 1, lines 24-33).

b.   Referring to claim 9, Bell does not explicitly disclose wherein the data used by

the construction unit is combined and stored. Patent No. 5,422,989 discloses wherein the

data used by the construction unit is combined and stored (Fig. 6; column 9, lines 13-34).

c.   Referring to claim 10, Bell does not explicitly disclose wherein the data used by

the constructing unit is stored separately. Patent No. 5,422,989 discloses wherein the data

used by the constructing unit is stored separately. (Fig. 4; column 7, lines 24-43).

d.   Referring to claim 20, Bell does not explicitly disclose combining and storing the

three-dimensional data. Patent No. 5,422,989 discloses combining and storing the three-

dimensional data. (Fig. 6; column 9, lines 13-34).

e.   Referring to claim 21, Bell does not explicitly disclose storing the three-

dimensional data serperatley. Patent No. 5,422,989 discloses storing the three-

dimensional data serperatley (Fig. 4; column 7, lines 24-43).

Response to Arguments

7.   Applicant's arguments filed 3/304 have been fully considered but they are not persuasive.

Applicant argues that Bell does not teach or suggest a three-dimensional data set of the object.

However the data set of Bell is a cross-correlation surface of images of the object, which meets

the limitations of the claim.

Conclusion

8.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**.

The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor
(Receptionist).
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the
Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm
26 April 2004

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600